My TUM Course Navigator Project Documentation

for CIT623000 Responsible, Sustainable and Inclusive Digital Product Creation

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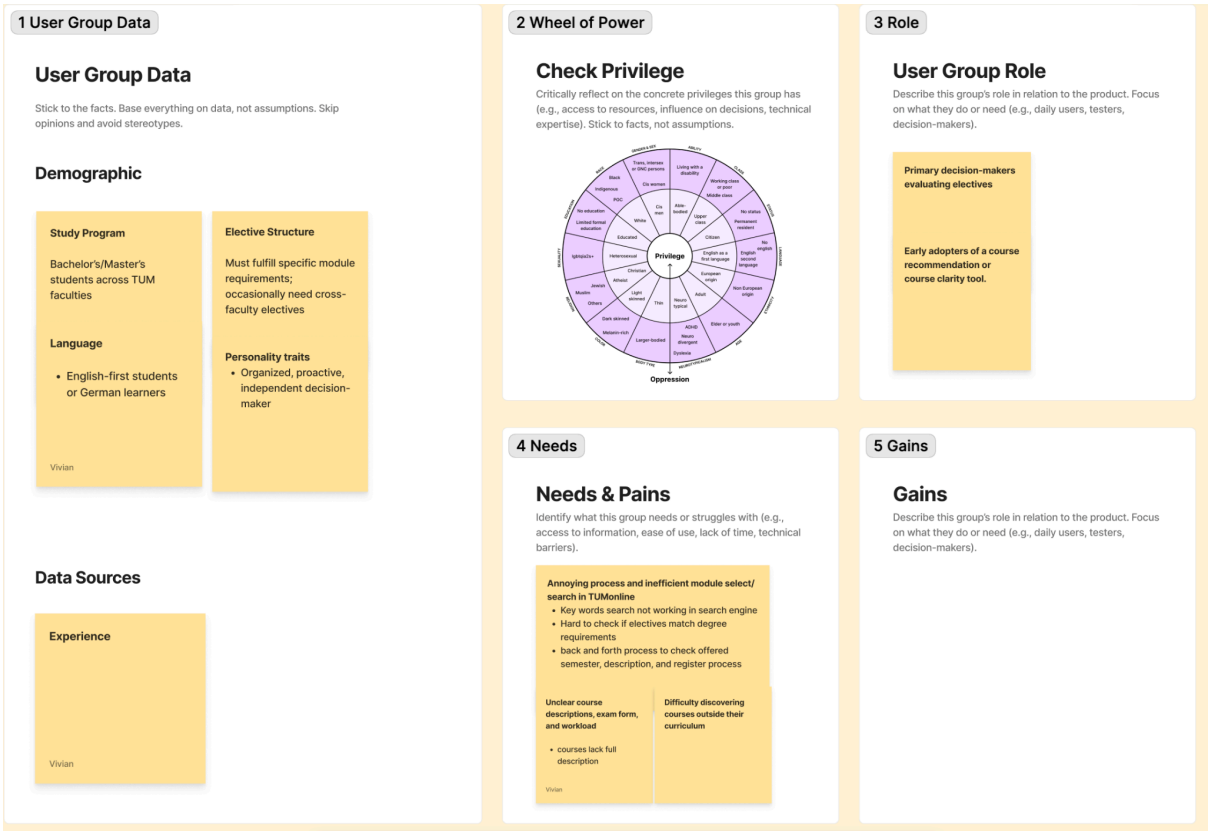
This project addresses challenges related to students' course selection at TUM. The project followed a structured design process that combined user research, reflection, and iterative development.

Conscious Service Design methods were used throughout the semester, helping to critically examine assumptions, consider diverse user perspectives, contextual constraints, and ethical implications. This documentation outlines how the selected methods were applied and how they influenced the project's direction and design decisions.

Inclusive segment cards

Inclusive Segment Cards were used to identify and articulate the needs, constraints, and motivations of diverse student groups involved in the course selection process. Rather than focusing on demographic stereotypes, the cards helped structure discussions around **needs, pains, gains, and privilege**, supporting a more inclusive and reflective design process.

Self-Directed Academic Students



User Story: "As a TUM student who wants to choose the right electives for my degree, I want a tool that clearly shows which courses match my module requirements and are available this semester, so I can save time and confidently pick the best options without navigating confusing pages on TUMonline."

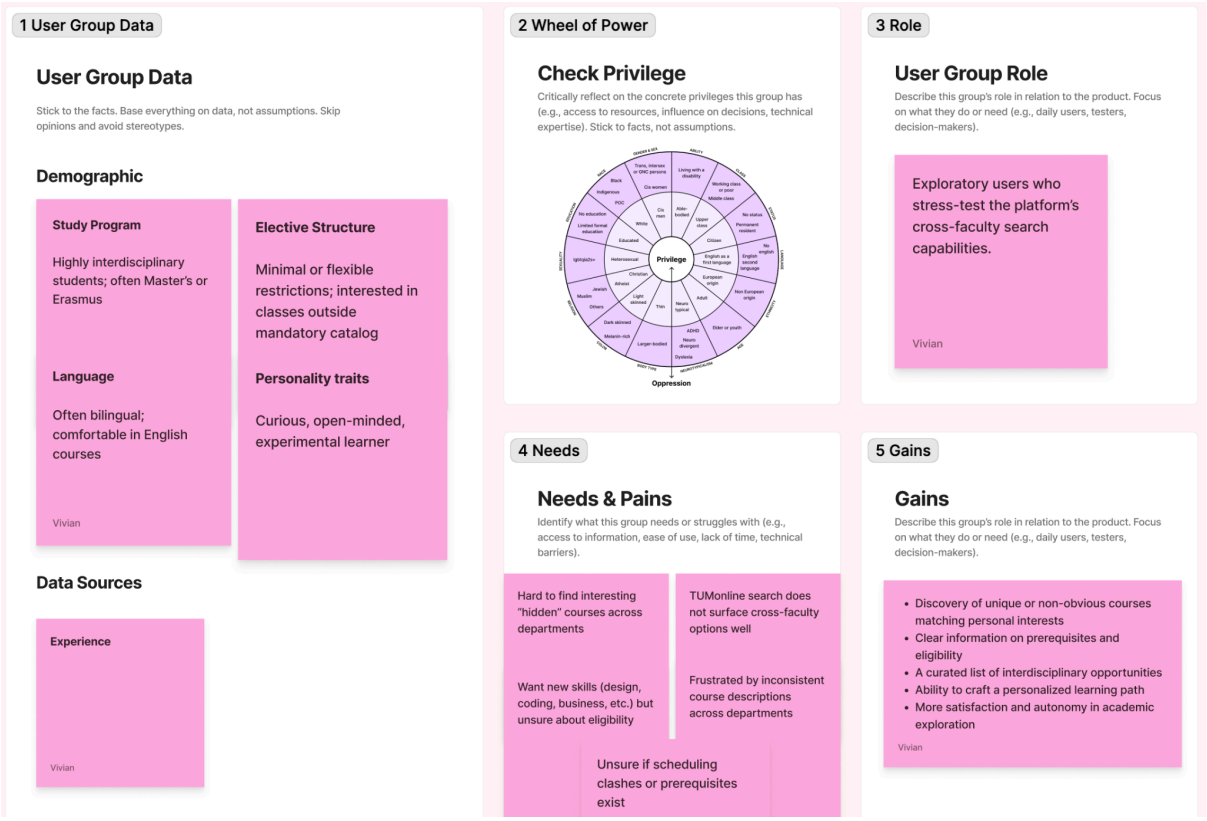
Relevance

This group includes students who are structured in their academic planning and need to fulfill specific module or degree requirements. Their course choices are often constrained by formal rules, prerequisites, and credits amount, making clarity and efficiency particularly important. The main pain points of this group are frustration with inefficient search and filtering in TUMonline and unclear course descriptions (esp. workload, exam formats, etc.).

Impact on design decisions

Insights from this group reinforced the need for: clear visual module compatibility, transparent workload and exam information + reduced friction in the course discovery and curriculum-relevance assessment.

Explorers & Curriculum-Breakers



User Story: "As a TUM student who wants to go beyond my curriculum and discover interesting courses across different faculties, I want an easy search tool that surfaces interdisciplinary electives and explains prerequisites, so I can build a more personalized and diverse academic experience."

Relevance

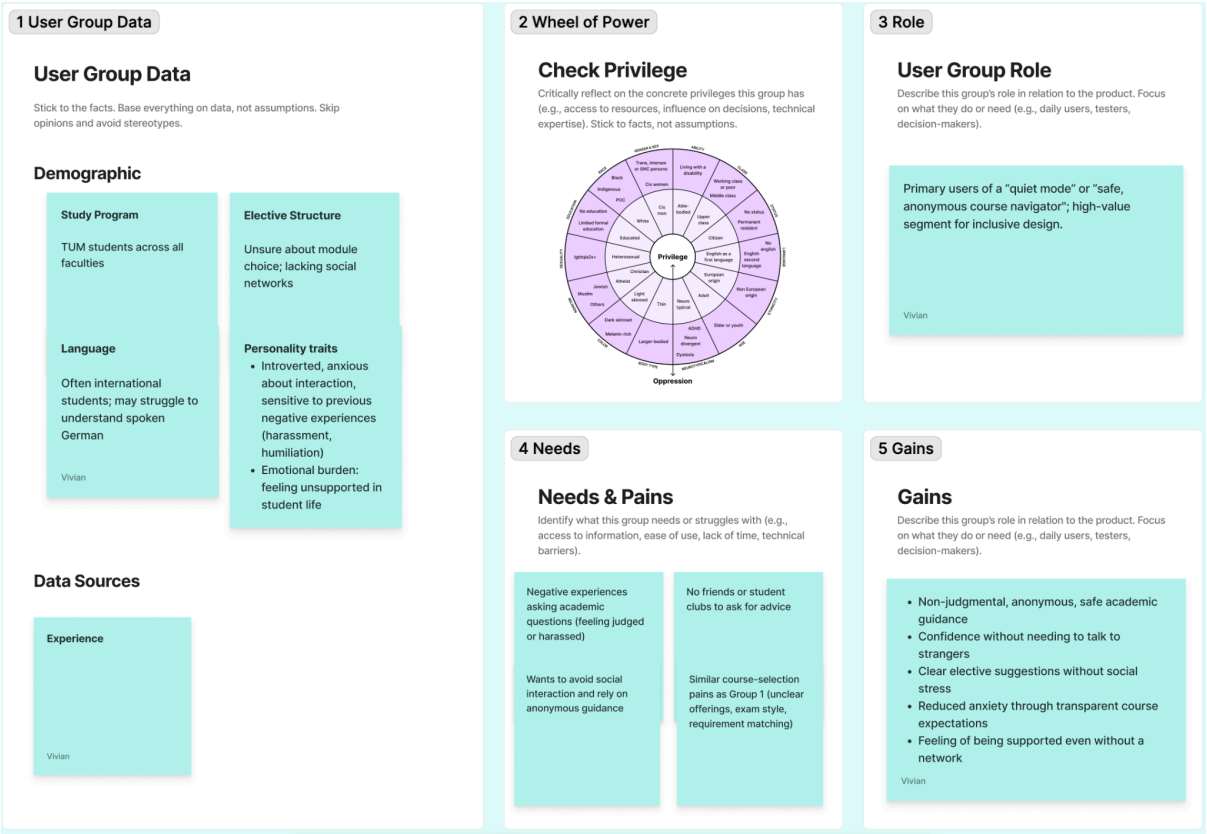
This group represents students who actively seek courses beyond their mandatory curriculum, often across faculties. They are driven by personal interest and need for skill

development but face difficulties discovering suitable electives and understanding prerequisites. Students of this group experience difficulty finding “hidden” courses and desire for inspiration and course recommendations that align with their personal interest.

Impact on design decisions

This user group highlighted the importance of: discovery-oriented search features + support of the exploratory behavior.

Students Facing Social or Safety Challenges



User Story: "As a TUM student who feels anxious asking others for help due to past negative experiences, I want an anonymous and judgment-free way to understand course content and requirements, so I can choose electives without needing uncomfortable social interactions."

Relevance

This group includes students who feel socially unsupported, anxious about asking questions, or affected by past negative academic or social experiences. Their challenges are often invisible but significantly impact confidence and decision-making. Such students tend to prefer anonymous, judgment-free information sources.

Impact on design decisions

Insights from this group emphasized: the need for anonymity and non-judgmental guidance and designing for emotional safety alongside functional clarity.

Reflection on the method

Using Inclusive Segment Cards helped us critically reflect on assumptions about “typical” students and differences in access and confidence. The method supported more informed design decisions by grounding discussions in concrete user needs and by ensuring that vulnerable or less visible student groups were considered throughout the design process.

Initially, the Inclusive Segment Cards were developed based on observations, course experiences, and team discussions, and therefore reflected **assumptions**. To validate and refine these, a quantitative survey was conducted among TUM students.

The survey results largely confirmed the relevance of the identified user groups. In particular, they highlighted a strong need for **structured semester planning and course comparison** among students who must navigate module requirements and workload constraints (which are our primary user group). Additionally, the data revealed the importance of **personal interest and exploratory behavior** in course selection, supporting the inclusion of students seeking courses beyond their core curriculum.

Responses related to information sources indicated that a subset of students highly relies on peer recommendations, reinforcing the relevance of **anonymity and non-judgmental access to information** for students facing social or psychological barriers.

Critical Reflection cards

The Critical Reflection Cards is a tool used to identify ethical, social, and sustainability-related risks in digital products. The method supports critical discussion of potential negative impacts, blind spots, and unintended consequences. In this section we will further reflect on how each discussion impacted our features (**Smart Course Search, Personalized Course Recommendations, Semester Planner, Peer Course Reviews**) and what thoughts it triggered.

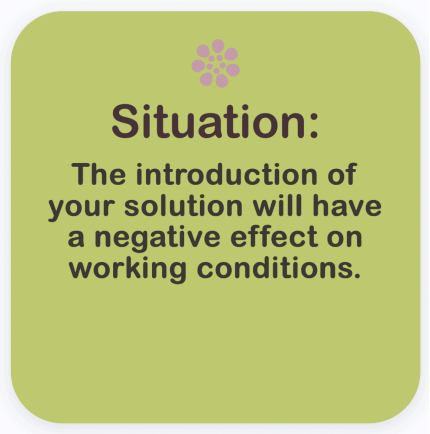
Card One: Bullying and Harassment

We discussed that course-selection is already a high-stress context. Students who have experienced bullying may avoid spaces where they can be judged, bullied, or attacked (for example, Whatsapp/Discord chats, Facebook groups, etc.). A review system can unintentionally become a channel for “public shaming” (e.g., overly personal comments about lecturers, cohorts, or specific students) and can amplify fear of participating.

This reflection card is tied to the previously identified **Students Facing Social or Safety Challenges** user group. Students in this group are particularly sensitive to public judgment in academic contexts. For them, unstructured or emotionally charged reviews can trigger stress and avoidance.

To address these concerns, we designed the review system in a way that minimizes the risk of public judgment and emotional exposure. **Clear review guidelines** define what type of feedback is appropriate and constructive, helping to set expectations and prevent harmful comments. **Reviewers remain anonymous** at the interface level, which reduces fear of negative social interactions and lowers the barrier for participation for students who feel vulnerable. This anonymity is complemented by **moderation and reporting** to ensure that safety is maintained for all users (explained in the next section).

Card Two: Working Conditions



The introduction of a Peer Review Course Evaluation System may negatively affect the working conditions of teaching staff. Even when student anonymity is preserved, unmoderated feedback can create stress, reputational harm, and a sense of constant surveillance for lecturers and professors. While the **Peer Course Reviews** feature empowers students, it also introduces a power imbalance where teaching staff are evaluated without direct control over the platform.

While discussing this card, we recognized that unrestricted free-text reviews could enable harassment, unfair criticism, or emotionally harmful language, even when not intended.

To address this, we deliberately moved away from open comment sections toward **structured and neutral feedback formats**. Reviews are based on predefined categories, combined with descriptive tags rather than personal commentary. In addition, automated

moderation mechanisms, including AI-based harassment and hate-speech filtering, help ensure that submitted content remains respectful and constructive.

Although student anonymity is preserved at the interface level to encourage feedback participation, reviews are still **linked to verified student accounts internally (TUMonline)**. This creates accountability within the system while protecting psychological safety for both students and teaching staff.

Card Three: Personal Information Disclosure

This situation is particularly relevant to the **Personalized Course Recommendations** feature, where personalization mechanisms can implicitly encourage users to disclose sensitive information. The card made us question what level of personal data is truly necessary to deliver meaningful personalization. While many students value tailored recommendations, not all feel comfortable sharing private details such as mental health challenges, personal struggles, or identity-related information.

Therefore, we opted for a **data-minimization approach**. Personalization is primarily based on non-sensitive information such as curriculum structure, stated academic interests, and past course interactions, rather than personal or identity-related data. Any **additional inputs** are **optional** and are accompanied by transparent explanations that clarify why the information is requested and how it benefits the user. The system also offers privacy-first defaults, allowing students to receive recommendations even with minimal setup or without creating a detailed profile.

How the Conscious Service Design methods supported and shaped the project

The Conscious Service Design methods played a central role in shaping the direction and the ethical grounding of the project. Rather than applied as isolated exercise, the methods continuously promoted design discussions and feature prioritization throughout the semester.

The **Inclusive Segment Cards** helped shift our perspective from designing for a “typical” student toward acknowledging diverse needs, constraints, and emotional contexts. By explicitly considering students who actively explore courses beyond their curriculum, and students facing social or psychological barriers, alongside with realizing that the students from the primary group are highly structured in their academic planning, we were able to balance functional clarity with emotional safety. This directly influenced the development of our core features such as the **Peer Course Reviews, Semester Planner**, **Smart Course Search**, and **Personalized Course Recommendations**, which combine curriculum alignment with discovery-oriented exploration while avoiding unnecessary complexity or pressure.

The **Critical Reflection Cards** encouraged systematic reflection on the broader social, ethical, and institutional impacts of the solution. These reflections moved the project beyond usability concerns and promoted discussions about power dynamics, responsibility, and unintended consequences. As a result, several conscious design decisions emerged, including the use of **student anonymity**, **controlled and moderated feedback**, and **neutral course evaluation formats**. These choices were not driven solely by user convenience but by an explicit intention to protect vulnerable students, prevent harassment, and avoid placing pressure on teaching staff.

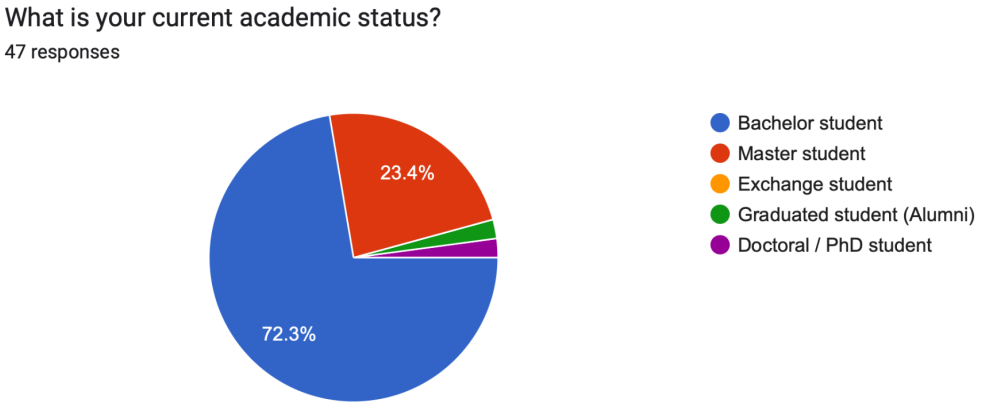
Together, these methods ensured that design decisions were not only user-centered but also context-aware and ethically informed. They helped us justify why certain features were included, constrained, or deliberately omitted. Overall, the Conscious Service Design methods shaped the project into a solution that supports informed course selection while fostering a safe, respectful, and inclusive academic environment.

Appendix A: Survey Results

To validate and refine the assumptions derived from the Inclusive Segment Cards, a quantitative survey was conducted among TUM students. The goal of the survey was to better understand students' course selection behavior, information sources, decision-making challenges, and priorities when choosing courses.

A total of **47 current and former TUM students** participated in the survey, covering different academic stages, including Bachelor's, Master's, and doctoral studies, and more than 10 different study programs. The results were used to assess the relevance of the identified user groups and to support key design decisions related to course discovery, semester planning, personalization, and anonymous access to information.

The following section presents selected survey results that informed and supported the design process.



In the following section, participants evaluated a series of statements related to **course selection behavior, information access, decision-making challenges, and preferences for guidance**. The statements were designed to explore how students search for courses, how confident they feel during the selection process, and to what extent they value independent, anonymous, or structured support. Responses were collected using a **5-point scale**, ranging from **1 ("strongly disagree") to 5 ("strongly agree")**. This approach

allowed us to assess general tendencies, levels of agreement, and potential areas of friction in the course selection experience across different student profiles.

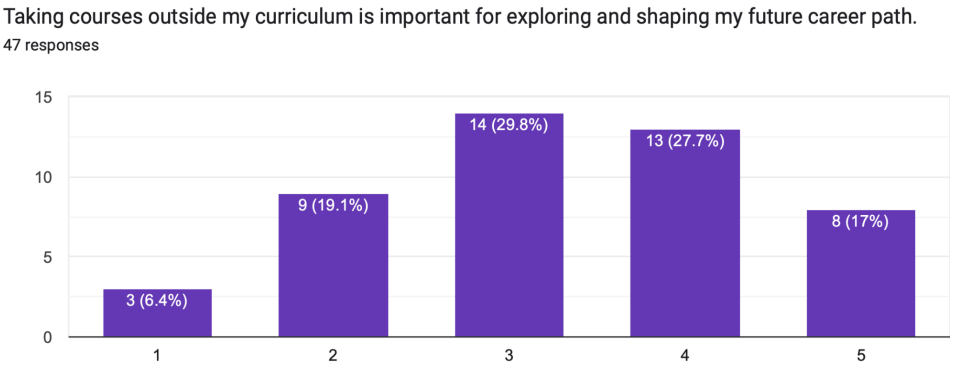


Figure A1: Course selection outside curriculum

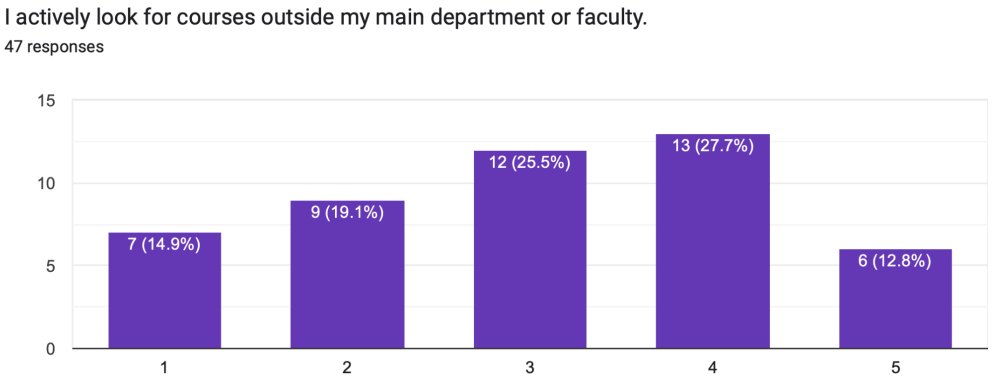


Figure A2: Exploratory behavior

I would value anonymous or non-interactive digital guidance when choosing courses.
47 responses

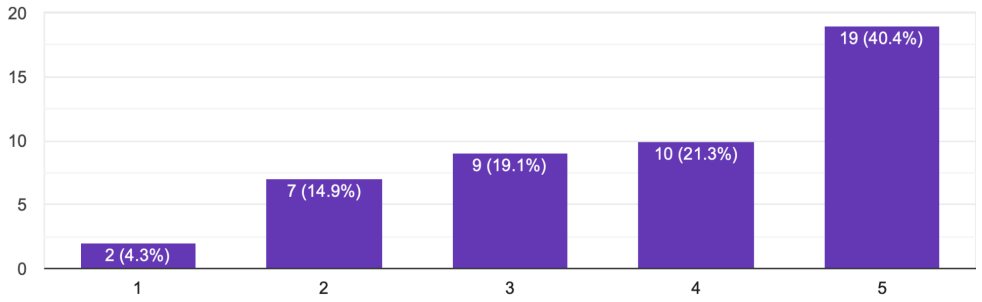
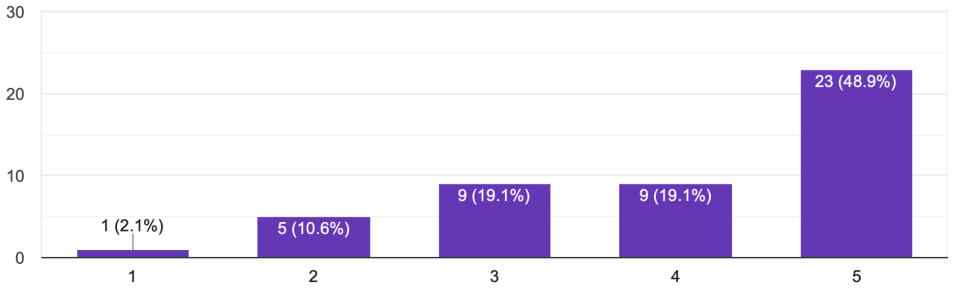
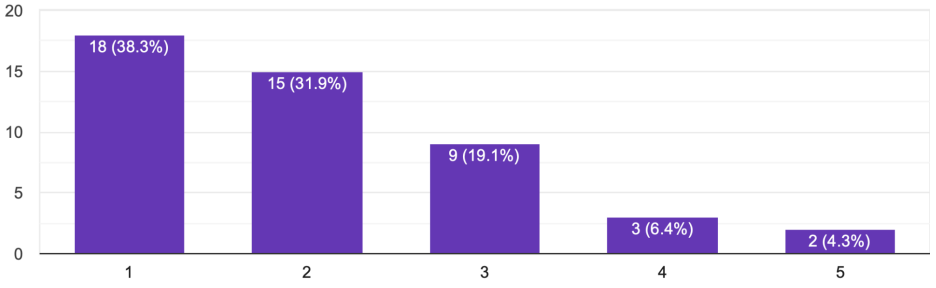


Figure A3: Anonymity value

I need to consider multiple factors at the same time (e.g., eligibility, workload, credits, module restriction) when registering for a course.
47 responses

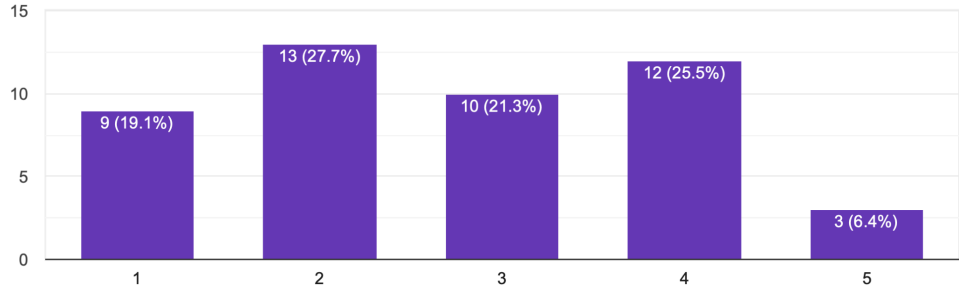


I always know where to find information about newly offered seminars or courses.
47 responses



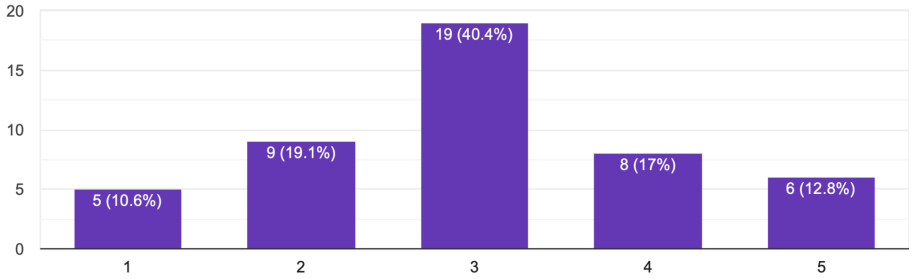
I can easily find senior students or peers with relevant experience to ask about course details or recommendations.

47 responses



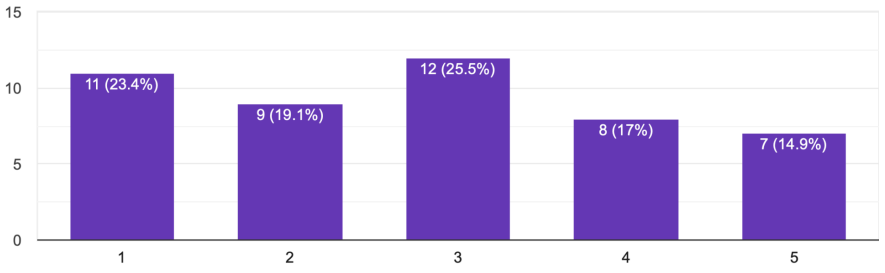
I prefer to explore and evaluate courses privately rather than asking others.

47 responses



I have had negative experiences asking questions about course information/selection in online settings (e.g., group chats, forums).

47 responses



In addition to the scaled statements, the survey included **multiple-choice and selection-based questions** aimed at capturing **concrete decision factors and information sources** used during course selection. These questions focused on practical behaviors, such as which criteria students prioritize, where they obtain information, and which resources they rely on most when making decisions.

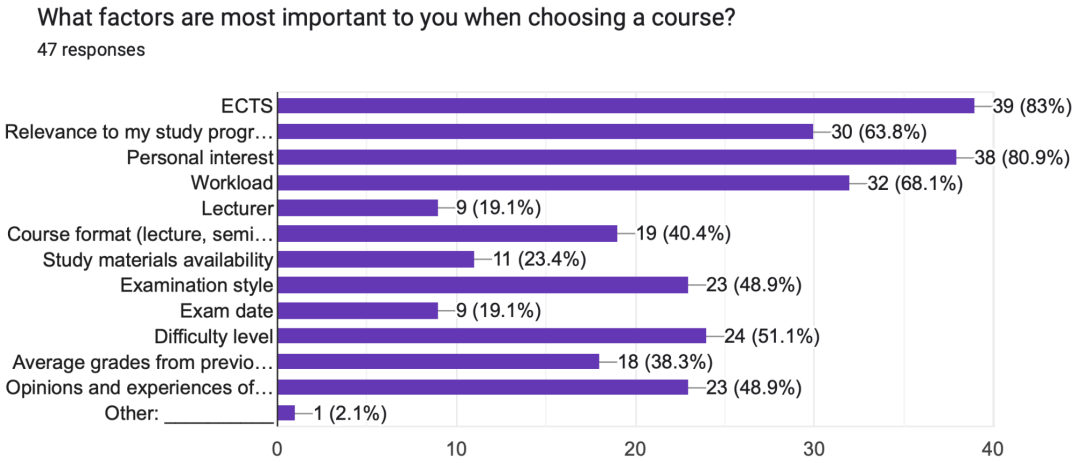


Figure A4: Choice-supporting factors

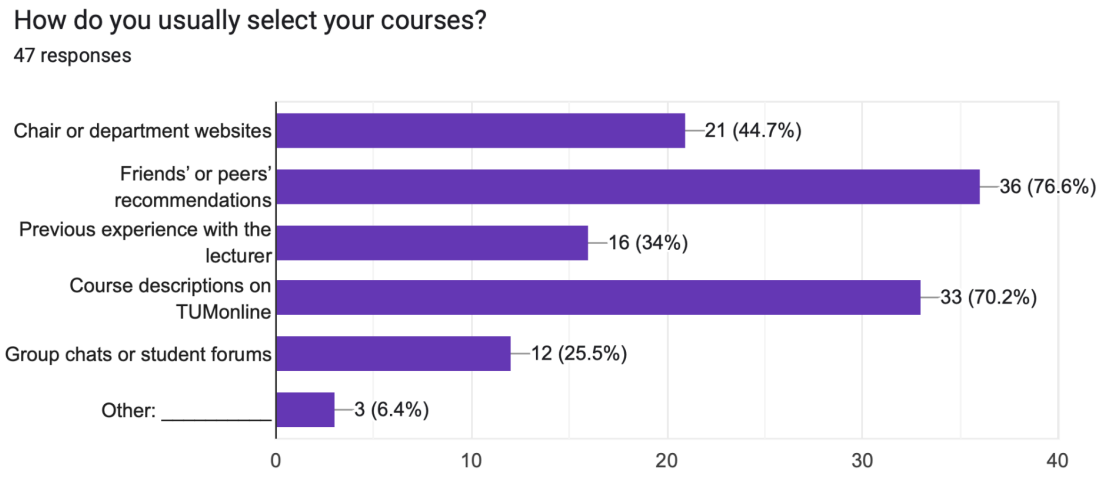
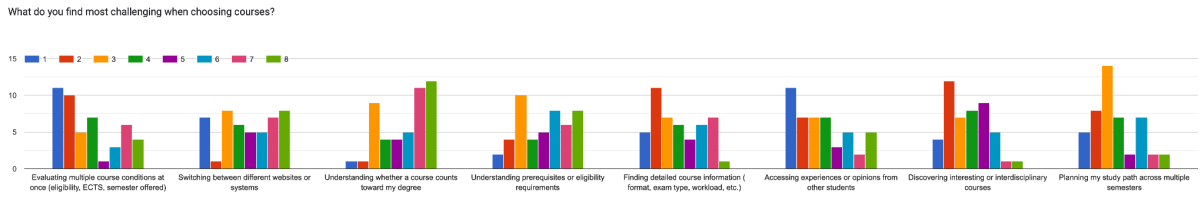


Figure A5: Sources of information



Overall, the survey results provided an empirical validation of the identified user groups and supported key design decisions, particularly in the areas of course discovery, comparison, personalization, and anonymous course review.